

A viable compactification scenario in Gauss-Bonnet gravity

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Abstract

In this talk we address two important issues which could affect reaching the exponential and Kasner asymptotes in Einstein-Gauss-Bonnet cosmologies - spatial curvature and anisotropy in both three- and extra-dimensional subspaces. In the first part we consider cosmological evolution of spaces being the product of two isotropic and spatially curved subspaces. We consider all possible number of spatial dimensions and provide description of the curvature effects in these dimensions. It is demonstrated that the dynamics in $D = 2$ (the number of extra dimensions) and $D > 3$ is different. In particular, the regime with the "stabilization" of extra dimensions could be reached only if $D > 3$. In the second part we study the influence of initial anisotropy. Our study reveals that transition from Gauss-Bonnet Kasner regime to anisotropic exponential expansion (with expanding three and contracting extra dimensions) is stable with respect to breaking the symmetry within both three- and extra-dimensional subspaces in any number of extra dimensions. This allows us to construct a scenario where isotropisation of outer and inner subspaces is reached dynamically from rather general anisotropic initial conditions.

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